WEST

Generate Collection Print

L7: Entry 6 of 28 File: USPT Oct 9, 2001

DOCUMENT-IDENTIFIER: US 6301640 B1
TITLE: System and method for modeling and optimizing I/O throughput of multiple disks on a bus

Detailed Description Text (73):
The pseudo code LoadIntoDiskBuffer (b), causes the disk to prefetch data block b into its cache so that a subsequent Read(b) will not incur disk head positioning time or a head-limited transfer rate. The prefetch occurs while the bus is busy transmitting data blocks from other disks and from the previous round. Thus, the random access latency is overlapped with bus transfers, and the bus transfers occur at the higher cache data rate, rather than the slower disk-head rate. The result is fair parallel I/O in rounds, with a high aggregate bandwidth for random I/O. It is noted that in accordance with another embodiment of the invention, instead of performing a prefetch for each iteration, the system may, for a specified number of iterations, transfer data located in the disk cache and request data corresponding to the following iteration to be transferred to the disk cache.

Detailed Description Text (75):
For disk drives that employ a SCSI bus protocol, a SCSI Prefetch implementation allows the prefetch of data blocks without the need to prefetch a sector just prior to the data block intended to be transferred. This prefetch implementation would only have the overhead of sending one extra SCSI request for each data block.

Other Reference Publication (1):
Arunachalam, M., Choudhary, A., and Rullman, B. "A prefetching prototype for the parallel file system on the Paragon." Proceedings of ACM SIGMETRICS Conference on Measurement and Modeling of Computer Systems (Ottawa, Canada), pp 321-323, May 1995.

Other Reference Publication (4):
Cao, P., Felten, E.W., Karlin, A.R. and Li, K. Implementation and performance of integrated application-controlled caching, prefetching and disk scheduling. ACM Transaction of Computer Systems (TOCS) ACM Press, Nov. 1996.

Other Reference Publication (7):
Kimbrel, et al. A trace-driven comparison of algorithms for parallel prefetching and caching. Proceedings of the 1996 Symposium on Operationg Systems Design and Implementation (Seattle, WA), pp 19-34, USENIX Association, Oct. 1996.

Other Reference Publication (8):
Mowry, Denke and Krieger. Automatic compiler-inserted I/O prefetching for out-of-core applications. Proceedings of the 1996 Symposium on Operations Systems Design and Implementation (Seattle, WA), pp 3-17, USENIX Association, Oct. 1996.